

(54) SPUTTERING DEVICE

(11) 2-270962 (A) (43) 6.11.1990 (19) JP

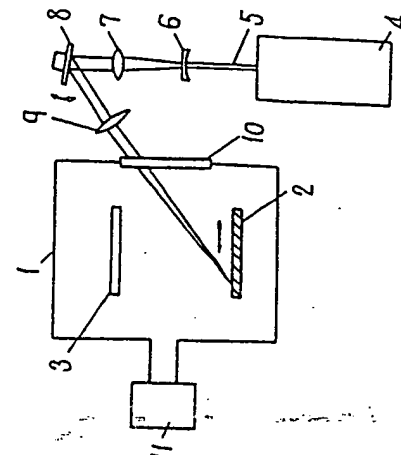
(21) Appl. No. 64-93530 (22) 13.4.1989

(71) MATSUSHITA ELECTRIC IND CO LTD (72) YUKIO NISHIKAWA(2)

(51) Int. Cl⁵. C23C14/34

PURPOSE: To form a thin film of a uniform thickness on a substrate by placing a target and the substrate parallel to each other in a vacuum vessel and irradiating the target with laser light through a vacuum-sealed window.

CONSTITUTION: A target 2 and a substrate 3 are placed parallel to each other in a vacuum vessel 1 and the target 2 is irradiated with laser light 5 through a vacuum-sealed window 10. In order to irradiate the target 2, a laser oscillator 4, a beam shaping device composed of a concave collimating lens 6 and a convex collimating lens 7, a galvanomirror 8 as a scanning optical device and a condenser 9 as a condensing optical device are arranged and the action of the scanning optical device is allowed to synchronize with the movement of the beam shaping device or the condensing optical device in the direction of the optical axis. The amt. of vapor generated from the target and deposited on the substrate can be made uniform over a large area.

**(54) MAGNETRON SPUTTERING DEVICE**

(11) 2-270963 (A) (43) 6.11.1990 (19) JP

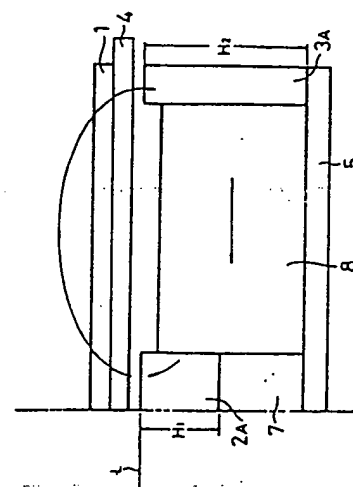
(21) Appl. No. 64-90816 (22) 12.4.1989

(71) MITSUBISHI KASEI CORP (72) YOJI ARITA

(51) Int. Cl⁵. C23C14/35

PURPOSE: To obtain a stabilized magnetron mode by providing a permanent magnet having horizontal magnetization between the inner and outer magnetic poles of a soft magnetic material and making the height of the outer magnetic pole greater than that of the inner magnetic pole.

CONSTITUTION: The inner magnetic pole 2A and the outer magnetic pole 3A of the opposite polarity encircling the inner magnetic pole are provided in the planar magnetron sputtering device. A target material 1 is laid over the inner magnetic pole 2A and the outer magnetic pole 3A. The permanent magnet 8 having horizontal magnetization is set between the magnetic poles 2A and 3A. Both magnetic poles 2A and 3A are made of a soft magnetic material. The height H_2 of the outer magnetic pole 3A with the target 1 side as the reference is made greater than the height H_1 of the inner magnetic pole 2A. Consequently, highly efficient sputtering can be conducted.

**(54) DEVICE FOR FORMING TUNGSTEN FILM**

(11) 2-270964 (A) (43) 6.11.1990 (19) JP

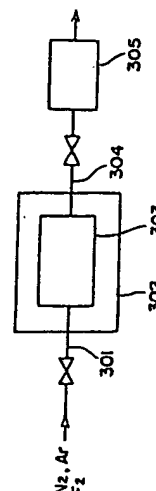
(21) Appl. No. 64-90226 (22) 10.4.1989

(71) TADAHIRO OMI(1) (72) TADAHIRO OMI(3)

(51) Int. Cl⁵. C23C16/14, C23C16/02

PURPOSE: To deposit a high-quality tungsten film on a silicon substrate by introducing gaseous WF_6 and gaseous H_2 into a film forming chamber and forming the contact part of the film forming chamber with the gaseous WF_6 from a metallic material having a fluoride passive film consisting essentially of a metal fluoride fulfilling the stoichiometric ratio.

CONSTITUTION: A means for introducing WF_6 and a means for introducing gaseous H_2 are provided to the film forming chamber 303. At least the contact part of the chamber 303 with the gaseous WF_6 is formed with a metallic material having a fluoride passive surface consisting essentially of a metal fluoride fulfilling the stoichiometric ratio. A means for introducing gaseous F_2 into the chamber 303 is provided. At least the contact part of the means for introducing gaseous WF_6 with the gaseous WF_6 is made from a stainless steel having an oxide passive body on the surface. Consequently, contact resistance can be reduced at the low substrate temp.



OHM 026